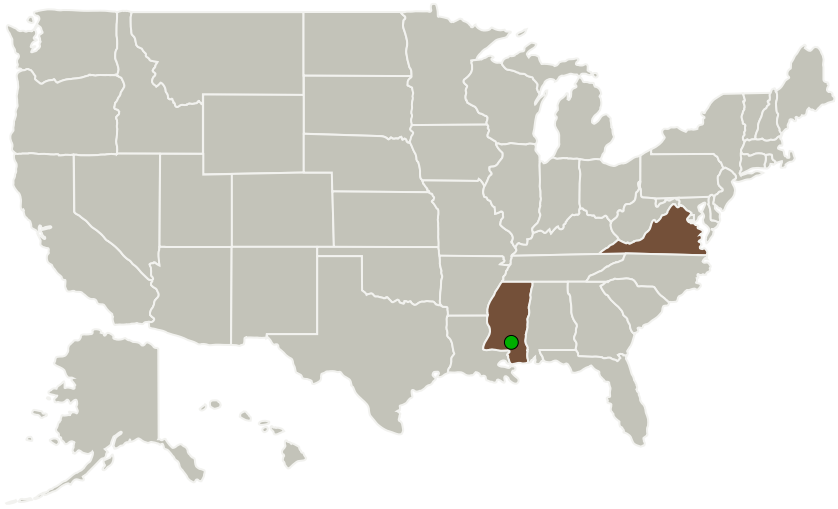
Polyoxometalate and Zirconium-Phosphate Conversion Coating for Steel Piping, Phase I

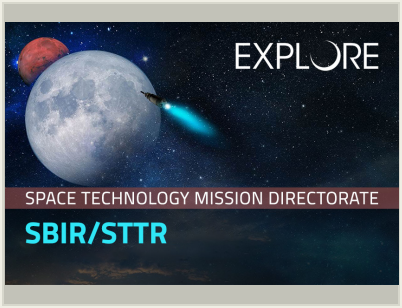
Completed Technology Project (2012 - 2012)

Project Introduction

In Sub-topic O3.04, NASA has identified a need for control of material degradation to extend the life and reduce the life-cycle costs of piping systems subject to microbial influenced corrosion in the presence of untreated or brackish water. The corrosion mechanisms of greatest interest are salt and acid attack due to exposure to brackish or untreated waters and bacteria, fungi, and archaea. International Scientific Technologies, Inc., in conjunction with Ferrum College, proposes the development of a protective barrier conversion coating to prevent corrosion cell formation in steel substrates. Phase I Technical Objectives include selection, characterization and fabrication of polyoxometalate building blocks to complement zirconium-phosphate conversion coating, polyoxometalate-zirconium phosphate conversion-coating system design, and measurement and test of individual and layered polyoxometalate conversion coatings for corrosion inhibition efficiency to salt and acid. The anticipated result of the Phase I and Phase II programs is the development of an environmentally friendly corrosion-resistant conversion coating that can be utilized on coated and un-coated ferrous materials.

Primary U.S. Work Locations and Key Partners





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Organizations Performing Work	Role	Type	Location
International Scientific Technologies, Inc.	Lead Organization	Industry	Dublin, Virginia
Stennis Space Center(SSC)	Supporting Organization	NASA Center	Stennis Space Center, Mississippi

Primary U.S. Work Locations	
Mississippi	Virginia

Project Transitions

February 2012: Project Start

August 2012: Closed out

Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/140270)*

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

International Scientific Technologies, Inc.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

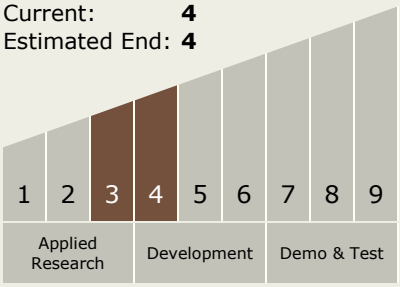
Carlos Torrez

Principal Investigator:

Michael Harig

Technology Maturity (TRL)

Start: **3**
Current: **4**
Estimated End: **4**



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Technology Areas

Primary:

- TX13 Ground, Test, and Surface Systems
  - TX13.1 Infrastructure Optimization
    - TX13.1.1 Natural and Induced Environment Characterization and Mitigation

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System